

VARIABLE WAVEGUIDE**ABSTRACT**

A variable waveguide system (100). The variable waveguide system (100) includes a waveguide (102), a dielectric structure (116) including at least one cavity disposed within the waveguide, and a conductive fluid (126). The cavity is filled with the conductive fluid (126) in a first operational state, and the cavity is purged of the conductive fluid (126) in a second operational state. A fluid control system (150) can be provided for transferring the conductive fluid (126) in and out of the cavity in response to a control signal (174). The waveguide (102) can have a first cutoff frequency in the first operational state and a second cutoff frequency in the second operational state. Further, the waveguide (102) can have a first electrical length in the first operational state and a second electrical length in the second operational state.